Model 959AF Air-Feed AutoFolder

Installation, Maintenance, & Operating Instructions

Specifications

Feed Speed	18,000 pcs. per hour*
Sheet Capacity	200 Sheets
Types of Folds	Letter, Half, Z, Double Half, French, Baronial
Feeding Method	Bottom Vacuum
Lightest Paper	16# (Bond)
Heaviest Paper	70# (Bristol)
Max. Paper Size	20" x 14 1/16" (66.04 x 35.72cm)
Min. Paper Size	2" x 3 1/4" (5.08 x 8.26 cm)
Max. Fold Length	
First Fold	13" (33.02cm)
Second Fold	13" (33.02cm)
Min. Fold Length	
First Fold	1 1/2" (3.81cm)
Second Fold	1 1/2" (3.81cm)
Electrical Specifications	115V 60 HZ (9.5 Amps)
UL CSA Approved	Yes
Dimensions (Assembled)	23"H X 23"W X41"D
Shipping Weight	220lbs

* 8 1/2 x 11 sheet of paper
17" Long Paper Maximum

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Serial # _____

Introduction

Thank you for selecting the Martin Yale Model 959AF Air-Feed AutoFolder. All components have been thoroughly inspected and performance tested to provide you with the best folder value in its class. Before each machine is packed for shipment, it must pass a critical performance test, including folding, scoring, and perforating. This folder can execute Half, Double Half, Zee, French, Baronial, and custom folds within its paper size capacity, as well as Letter Folds (up to 17" paper). The machine can also score, slit, and perforate separately, or while folding.

Please review this publication in its entirety before attempting to operate your folder. Thorough understanding of this information will help eliminate most operator-associated errors and ensure years of trouble-free performance.

WARNING! Never connect power to the machine until you are ready to set up and operate the folder. This machine contains moving parts. During setup, operation, and maintenance keep hands, hair, loose clothing, and jewelry away from all moving parts. Serious bodily injury could result. Service, or disassembly of side covers should only be attempted with the power disconnected and locked out. The AC outlet for this machine must be near by and not blocked.

Martin Yale
INDUSTRIES, INC.

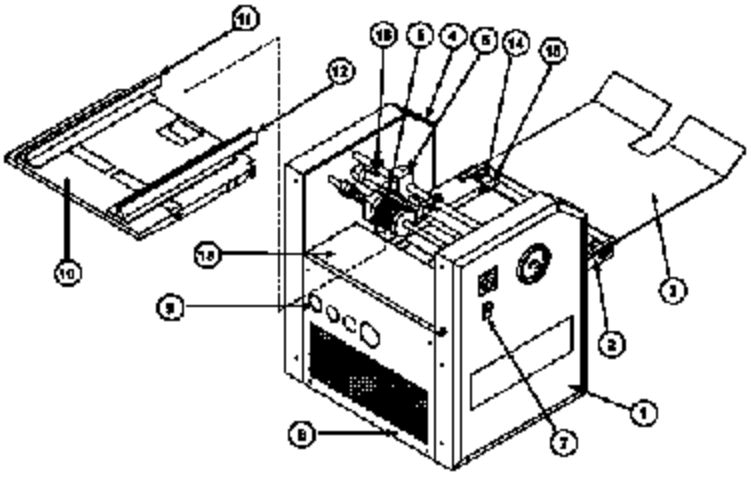
1.0 General

Operational setup of the folder is simple and quick. No complicated procedures are involved. A simplified fold chart is prominently displayed on the exit table. The chart corresponds to the alphabetical letter settings on the fold table scales. See section 4.3 for an example of fold chart.The scales are calibrated in both inch and metric graduations. The folder features a positive drive system that requires minimal internal drive maintenance. The exclusive bottom, air-assisted vacuum feed is engineered for accuracy and consistency, and eliminates the need to fan paper before folding. The angle of the feed table and the air-lift design of the paper guides provides minimal drag on the bottom sheet as it feeds into the folding rollers. More importantly, this system ensures smudge-free folding of all paper stocks that fall within machine parameters. The variable SCR speed control allows you to customize the speed setting to each application. Although your folder was thoroughly tested and precision adjusted before shipment, mis-handling during shipment may necessitate readjustment. We recommend checking these adjustments before you attempt to operate the folder. See Sections 5.2 & 5.3 in this manual.

2.0 Nomenclature

The parts diagrams and parts lists will be used throughout this manual to describe accessories and parts for your air-feed folder.

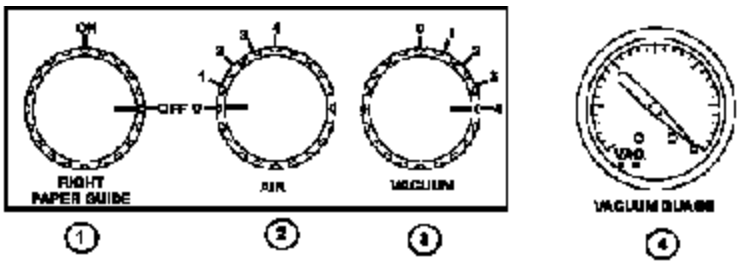
Overview



1. Right Side Cover
2. Exit Table
3. Receiving Tray
4. Left Side Cover
5. Sheet Detector Block
6. Vacuum Roller
7. Power Switch
8. Front Panel
9. Control Area
10. Feed Table
11. Left Paper Guide
12. Right Paper Guide
13. Pump Vent Guard
14. Conveyor Idler Shaft
15. Conveyor Belt
16. Guide Finger Assembly

***NOTE: Fold Tables and Hoses are not shown for clarity.**

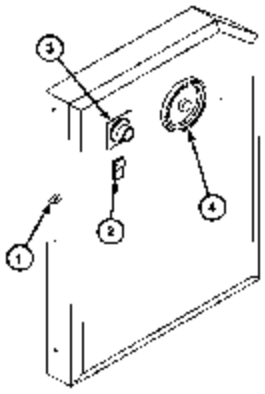
Controls



1. Right Paper Guide Control
2. Air Control
3. Vacuum Control
4. Vacuum Gauge

Right Side Cover

1. Circuit Breaker
2. Power Switch
3. Paper Feed Speed Dial
4. Hand Wheel



3.0 Pre-Operation Folder Setup

After careful unpacking of the folder place the machine on a flat, level work surface or stand.

NOTE: The folder weighs 130lbs(unassembled). Use a mechanical lifting device.

Inspect the machine for signs of damage. If damage is apparent, call the freight carrier immediately, then call Martin Yale for instructions. The following items should be unpacked or installed onto the machine.

1. The first and second fold tables.
2. The feed table.
3. The feed table paper backstop.
4. The exit table.
5. The hand wheel.
6. The sheet detector, locking knob, and washer.
7. Three hex key wrenches. (Provided for assembly)

3.1 Installing The Fold Tables

Both fold tables are alike and can be used in either the first/upper or second/lower folding position. Each fold table has two pin slots on each side. One each to the left and right front of both the open/folding end and the closed/deflector end. The front slots, one on each side, are for location. The rear slots on each side are for positioning. The fold tables are supported on the machine by pins located on the left and right main frame. The pin locations for the first/upper fold table are above the upper accessory shaft and the tie rod. The pins for the second/lower fold table are above the pump guard.

To place the fold tables onto the machine, slide the front slot opening of the fold table onto the inner set of pins (closest to the folding rollers) with a light forward pressure. Lower the fold table onto the outer set of pins as shown in Figure 1.

Fig. 1

NOTE: When placing the fold table onto the machine with the deflector end toward the folding rollers, it may be necessary to rotate the handwheel counterclockwise. When removing the fold table with the deflector end toward the folding rollers, it may be necessary to rotate the handwheel clockwise. This will release any tension that may be between the table and the folding roller.

3.2 Installing The Exit Table

Install the exit table by engaging the two tabs into the slots provided on the conveyor table and lowering the exit table into position as shown in Figure 2.

Fig. 2

3.3 Installing The Feed Table

CAUTION: Never handle the feed table by the left or right paper guides. This will cause bending of paper guides, which will cause improper folding.

The feed table has four location slots, one each at the front and on the long side of the table. The feed table is supported on the folder by four pins. The pins are located above the feed roller shaft on the left and right main frame. Place the feed table onto the folder by engaging the front slots on the table with the pins nearest the folding rollers. This is best accomplished by inserting the table nearly vertically into the machine. Once the table slots engage the pins, lower the table down so the slots on the long side of the table slide over the other set of pins (See Figure 3).

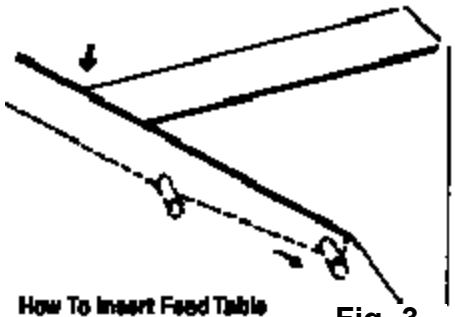


Fig. 3

3.4 Installing The Vinyl Air Hoses

Connect the vinyl air hose extending from the left main frame to the 90° fitting on the left paper guide. Likewise, connect the air hose extending from the right main frame to the 90° fitting on the right paper guide.

NOTE: Only the right paper guide air flow can be shut off.

3.5 Installing The Sheet Detector

Attach the sheet detector to the sheet detector block (orange side out) via the locking knob and washer. Slide the sheet detector to the top position and tighten the locking knob. Operational setting of the detector will be covered later in this manual.

3.6 Installing The Timing Block Turnbuckle Assembly

CAUTION: Both locking nuts on the turnbuckle assembly must be in the locked position (except when setting or resetting the timing). Do not rotate the assembly during installation. Mis-timing may result.

Connect the turnbuckle assembly to the underside of the feed table as shown in Figure 4. One end of the turnbuckle is factory installed to the timing block. A nut, brass sleeve, and bolt is factory installed to the other end of the turnbuckle. Remove the nut and slide the bolt through the hole in the underside of the feed table. Tighten the nut and bolt in place.

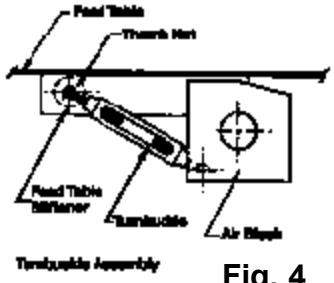


Fig. 4

3.7 Installing The Hand Wheel

Slide the hand wheel onto the shaft extending from the right machine cover. Lock the handwheel (hex socket) set screw onto the shaft with the provided hex key wrench.

NOTE: Make sure the set screw is securely tightened and hand wheel is locked into position.

3.8 The Accessory Shaft Journals

The upper and lower accessory shaft journals extend from the left machine cover. While these journals are factory installed, they may have come loose during shipping. Make sure the journal shafts are locked in position by rotating the lower shaft journal clockwise, and the upper shaft journal counterclockwise. Pull straight out to test. when locked they can not be pulled out.

3.9 Aligning The Sheet Detector Block

The sheet detector block is located on the top tie rod and is locked into position via a set screw on top of the block. Align the front of the sheet detector with the two target marks on the feed table. The target marks are to the left and right of the vacuum roller.

NOTE: When aligning the sheet detector to the target marks, look straight down on the target marks and the edge of the paper. Do not look from an angle, or the alignment will not be correct. Correct alignment is necessary for efficient paper feeding.

To align the sheet detector block, follow this procedure.

1. Loosen the set screw in the sheet detector block.
2. Rotate the block toward the front of the machine until the front (orange side) of the sheet detector is in approximate alignment with the target marks.
3. Place a sheet of paper onto the feed table.
4. Align the sheet detector block so the sheet detector tips are centered laterally over the left and right countersunk holes in the vacuum roller.
5. Rotate the hand wheel until the vacuum roller is positioned so the tips of the detector rest on the flat surface part of the roller, between the countersunk vacuum holes (when the detector is lowered).
6. Loosen the detector locking knob, lower the detector until it touches the round part of the wheel, and lock the detector locking knob.
7. Slide the sheet of paper down the feed table until the leading edge is aligned with the target marks.
8. Move the sheet detector block until the sheet detector just touches the paper. See Fig. 5
9. Tighten the set screw in the detector block.
10. Push the sheet detector to the top position and lock the detector locking knob.

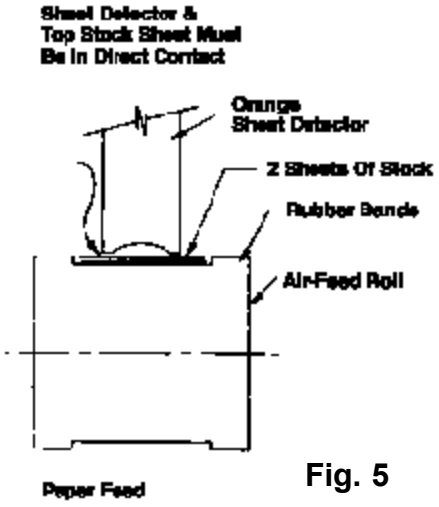

Sheet Detector & Top Stock Sheet Must Be In Direct Contact
Orange Sheet Detector
2 Sheets Of Stock
Rubber Bands
Air-Feed Roll
Paper Feed

Fig. 5

3.10 Setting The Guide Fingers

There are two guide finger assemblies, one each to the left and right of the sheet detector block assembly. To set the guide finger assemblies, follow this procedure:

1. Unlock the set screw in the locking collar and move each assembly to approximately three inches away from the detector block. Center fingers on paper guides.
2. Rotate the guide finger toward the front until the bottom of the guide clears the surface of the feed table.
3. Align the long part of the guide (attached to the locking collar) so it is 90° to the surface of the feed table.
4. The bottom of the paper guides should clear the surface of the feed table paper guides by 1/32". See Section 5.2.2.

NOTE: Failure to correctly set the guides may cause feeding problems or smudging.

3.11 Connecting Electrical Power

WARNING! Never connect power to the machine until you are ready to set up and operate the folder. This machine contains moving parts. During setup, operation, and maintenance keep hands, hair, loose clothing, and jewelry away from all moving parts. Serious bodily injury could result.

Machine requires 115 VAC 15amp. dedicated circuit. Before connecting the folder power cord to a dedicated electrical outlet of the appropriate voltage, be sure the speed control and pump motor switches are in the off position. Plug the folder power cord into an electrical outlet of the appropriate voltage and amperage.

CAUTION: Do not use extension cords. Be sure the folder is connected to an outlet of the appropriate voltage and amperage. Also make sure there are no other electrical appliances on the same electrical line. Failure to observe these precautions may cause inconsistent folding or machine malfunction.

3.12 Power Check And Test Run

To activate the machine, turn on the speed control switch. Rotate the variable speed control clockwise to the number 3 on the speed control scale. Let the machine run a few minutes. During this initial run, and after any extended period of folder inactivity, you may hear a muted thumping sound. The sound is the result of small, flat areas that form on the folding rollers at the contact point. This process is a normal occurrence and will disappear after a few minutes of running.

NOTE: You must let the folder run a few minutes after long periods of inactivity. Failure to do so may cause inconsistent folding.

Activate the pump motor switch. Basic setup of the folder is now complete. However, you must complete the operational setup section before attempting to fold paper.

4.0 Operation

WARNING! Never connect power to the machine until you are ready to set up and operate the folder. This machine contains moving parts. During setup, operation, and maintenance keep hands, hair, loose clothing, and jewelry away from all moving parts. Serious bodily injury could result.

4.1 How Paper Is Folded On The Folder

When the folder has been correctly adjusted and set up, paper stock to be folded is placed onto the feed table.

The pump switch is turned on and the air flow is adjusted so the paper stock is lifted slightly from the feed table. The speed control is turned on and a folding speed is selected. The vacuum valve is turned slowly clockwise until single sheets are forwarded into the folding rollers.

The following procedure describes how a letter fold is made. The feed system advances a sheet between the first and second folding rollers. The sheet then enters the first/upper fold table

and strikes the fold table paper stop. The sheet then enters between the second and third folding roller where the first fold is made. The sheet then enters the second/lower folding table and strikes the fold table paper stop. The sheet enters between the third and fourth folding rollers where the second fold is made. The folded sheet then enters between the upper and lower accessory guide rollers and exits onto the conveyor table. The sheets are stacked in an overlapping formation as they travel to the receiving tray.

Although your folder was thoroughly tested and precision adjusted before shipment, mis-handling during shipment may necessitate readjustment. We recommend checking these adjustments before you attempt to operate the folder. See Sections 5.2 & 5.3 in this manual.

4.2 Operational Setup

4.2.1 Setting The Sheet Detector

See Parts Diagram.
The sheet detector block assembly (Item 7) is mounted on the tie rod (Item 73) directly above the vacuum roller. The assembly consists of a sheet detector block with one block and one nose pipe set screw, the nose pipe (Item 11), the sheet detector (Item 10), and the locking knob and washer (Item 8 & 9).

The function of the sheet detector is to limit the number of sheets (1, 2, or 3) entering the folding rollers. The height of the sheet detector determines the number of sheets entering the folding rollers, based on the thickness of the sheet(s).

To set the sheet detector, cut a strip of paper 1 3/4" wide and 6" long from the stock to be folded. Fold the strip in half (1 3/4" x 3"). This strip is the correct thickness and dimension for setting the gap between the sheet detector and vacuum roller.

Make sure the sheet detector cannot contact the vacuum roller. Using the hand wheel, rotate the vacuum roller until the sheet detector will contact the roller on the flat surface between the countersunk holes. Place the non-folded end of the folded strip of paper on the vacuum roller between the two rubber rings (Item 4A). Lower the sheet detector onto the paper strip and lock into position. See Figure 5.

NOTE: Do not force the sheet detector onto the paper strip when tightening the knob.

Move the paper strip left to right and check the setting. Verify each leg is the same height. The sheet detector is correctly set when a light contact is felt between the the detector, paper, and vacuum roller. The correct setting of the sheet detector is important and will require practice. If the setting is too loose, more than one sheet may enter the folding rollers. If the setting is too tight, no sheets may enter, or intermittent feeding may occur. The sheets that do advance into the rollers may have marks or "flecks" on the leading edge.

NOTE: Because paper thicknesses vary and because of normal wear (See Figure 5.), the sheet detector gap must be set or reset each time the folder is used.

4.2.2 Feed Table Setup And Paper Loading

CAUTION: Never handle the feed table by the left or right paper guides. Doing so may cause misalignment of the guides and subsequent folding problems.

The feed table assembly consists of the left paper guide (Item 5C), the right paper guide (Item 5B), the paper guide rod (Item 5A), and the paper centering scale. The paper guides are attached to aluminum guide blocks. The guide blocks are "V" slotted. The paper guide rod is inserted through the "V" ways in the blocks and the guide blocks are locked to the guide rod via locking knobs.

To set the paper guides for the required paper width, loosen the locking knobs 1/4 to 1/2 turn. Slide each guide to the required width as indicated on the centering scale. The centering scale is located at the front edge of the feed table. (See Figure 6.) Retighten the locking knob. (The paper guide rod and paper guides are also adjusted in the field alignment procedure. See Section 5.3.)

After the paper guides are set, place one sheet of paper between the paper guides. The sheet should slide freely down between the guides without excessive side play or binding. Readjust the right/operators' side paper guide, if necessary until the sheet slides freely.

NOTE: The paper guides must be set correctly. Incorrect setting may cause inconsistent, inaccurate, or wrinkled folds.

Place a 2" stack of the paper to be folded into an Martin Yale Model 400 or Model 4200 Jogger. Jog the paper for about one minute. Jogging dissipates static electricity, aligns the edges, and helps keep sheets from sticking together. Place a 1/2" to 3/4" stack of jogged paper onto the feed table.

4.2.3 Fold Table Setup

See Figures 6, 7, and 8.

Each fold table assembly consists of an upper and lower fold plate, an aluminum deflector bar (Item 71N), two fold indicator rulers (Item 71O), an adjustable paper stop (Item 71C) with split nut and locking screw (Item 71M), two micrometer adjustment screws (Item 71I) with spring washers and lock nuts, and adjusting wheels. (See Figure 10.) Each fold table has an open/folding end, and a closed/deflector end.

Fig. 6

The job being processed determines how the fold table is mounted to the machine. See Section 4.3, Fold Settings, and Section 4.4, Perforating, Scoring, & Slitting.

The position of the fold table paper stop determines the location of each fold in the paper. The simplified fold chart (Item 64A) located on the exit table (Item 64) provides paper stop settings for five standard cut paper sizes. Two are metric (A3 & A4), and three are inch (8 1/2 x 11, 8 1/2 x 14, 11 x 17).

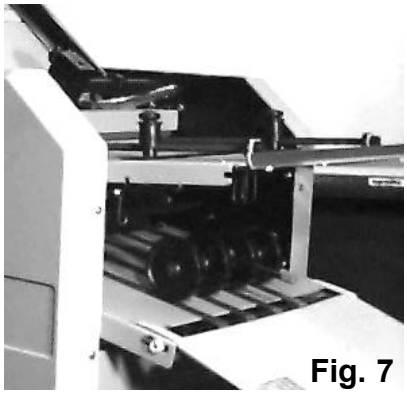


Fig. 7

The fold chart refers to “1st”, which corresponds to paper stop settings on the first/upper fold table, and “2nd”, which corresponds to paper stop settings on the second/lower fold table. The letters on the fold chart correspond to the letter position on the fold indicator rulers. The paper stop pointers should be set so they bisect the circle of the appropriate letter setting.

Any paper size not shown on the fold chart up to 14" x 18" can be set on the fold tables by following this procedure. Hand-fold the sheet into the required fold. Measure the distance between each fold. Set the paper stops on the first and second fold tables according to measurements.

To position, or reposition the paper stop on the fold table, loosen the locking knobs on top of the nylon split nut by two full turns counterclockwise. A spring under each split nut helps disengage the split nut from the micrometer rod threads. Place the thumb of your left hand on top of the left locking knob and the thumb of your right hand on the right locking knob. With the index and middle finger of each hand, grasp the split nut for control. Slide the paper stop assembly parallel along the micrometer rods to the required fold location/measurement. Release the split nut and retighten the locking knob.

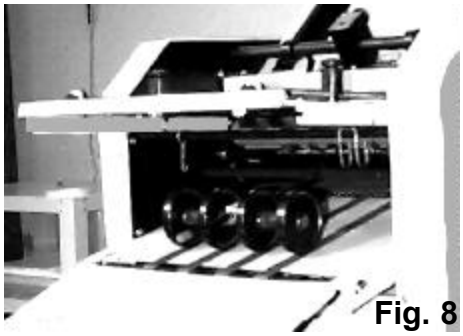


Fig. 8

CAUTION: Make sure the split nut is correctly meshed with the rod threads before locking into position. Failure to do so may damage the nut or threads.

Make fold corrections by loosening the locking knobs 1/4 to 1/2 turn. Move the appropriate micrometer wheel in the direction indicated. Retighten the locking knob.

NOTE: Variations in folding speed will affect fold consistency. Make sure corrections are made at the speed you intend to fold. If folding is interrupted, return the speed control to its previous position. Always clear the conveyor and exit table of folded material after an interruption. Failure to do so may cause stacking problems when folding is resumed.

4.2.4 Setup Of The Feed Table Backstop

The feed table backstop is a one inch angled aluminum fixture with a magnetic strip attached to one side. The feed table backstop should be used when processing 8 1/2" x 11" (A4) or smaller stock to prevent sheets from being blown back from the vacuum roller. Place the magnetic side of the backstop on the feed table so the vertical side is set against the tail (back) end of the paper stack.

4.2.5 Setup Of The Stacking Wheel Assembly

The stacking wheel assembly is located at the rear/exit side of the folder. The function of the stacking wheels is to arrange the exiting material from the folder into an overlapping stream on the conveyor table. Generally, the stacking wheels should be positioned about one inch from the edge of the sheet after the sheet has dropped to the conveyor table.

NOTE: Increasing or decreasing folding speed may require repositioning the stacking wheel assembly.

The assembly consists of the following. A square shaft with a compression spring on one side. An angled deflector plate is attached via two screws to the front of the square shaft. The stacking wheel shaft extends outward from the center of the square shaft. Mounted on the stacking wheel shaft are the axle box housing, the stacking wheel axle, two stacking wheel weights, and four stacking wheels.

There are two sets of stacking wheel assembly mounting holes located in the machine side frame, directly in front of the upper accessory shaft. To mount the assembly, insert the spring end of the square shaft into one of the two holes in the side frame (operators' side). Apply pressure (pull) the square shaft laterally toward the spring end of the shaft. As you do so, align the other end of the square shaft with the corresponding hole in the other side frame and release pressure.

To remove the stacking wheel assembly, apply pressure (pull) the square shaft laterally toward the spring end of the shaft. Doing so will pull the other end of the square shaft from the side frame. After the end is clear of the side frame, pull the entire assembly out of the machine.

For most folding jobs, the deflector plate faces upward. To help eliminate nesting and to improve the stacking of short folds and heavier paper stocks, the deflector plate should be faced downward. To do so, remove and reverse (turn over) the stacking wheel assembly. The deflector plate can also be fine adjusted by loosening the two mounting screws in the square shaft and lowering the slotted deflector plate up to 1/8". When using the stripper wire the deflector plate must be removed and the stacking wheel assembly should be installed in the inner set of holes.

The stacking wheel hook is located on the 1/2" tie rod, below the first/upper fold table. Use of the hook is necessary when perforating, scoring, or slitting sheets longer than 12". Simply rest the stacking wheel shaft in the curved section of the hook.

4.2.6 The Simplified Fold Chart

The simplified fold chart located on the exit table provides paper stop settings for five standard cut paper sizes. Two are metric (A3 & A4), and three are inch (8 1/2 x 11, 8 1/2 x 14, 11 x 17). The four most popular folds (letter, "Z", double half, and half) are illustrated.

The fold chart refers to "1st", which corresponds to paper stop settings on the first fold table, and "2nd", which corresponds to paper stop settings on the second fold table. The letters on the fold chart correspond to the letter position on the fold indicator rulers. The paper stop pointers should be set so they bisect the circle of the appropriate letter setting.

NOTE: To avoid confusion, the fold chart indicates all half folds should be made on the second fold table. However, half folds can be made on either fold table, depending on the weight of the paper being folded. Generally, lighter weight stocks should be folded with the first/upper fold table and heavier stocks with the second/lower fold table. (See Section 4.2.3.)

Any paper size not shown on the fold chart up to 14" x 18" can be set on the fold tables by following this procedure. Hand-fold the sheet into the required fold. Measure the distance between each fold. Set the paper stops on the first and second fold tables according to measurements.

4.2.7 The Speed Control

The speed control is an SCR type control that converts alternating current (AC) to direct current (DC). The folding motor of the folder is powered by direct current. The speed control is a combination on/off switch and variable speed regulator. The control is mounted on the upper left corner of the right (operators') side cover. To activate the feed system of the folder, turn the speed control clockwise. To incrementally increase the feed speed, continue to turn the speed control clockwise. To decrease the feed speed, turn the speed control counterclockwise. To deactivate the feed system, turn the speed control counterclockwise until it stops.

4.2.8 The Vacuum And Air Controls

See Figure 9.

Fig. 9

Extending from the upper left of the front panel are three control valves and a vacuum gauge. The left valve controls the air flow to the right feed table paper guide. The valve has two settings; on, and off. Turn the valve off when refolding previously folded stock. (See Section 4.3.5, setup for a french fold, and Section 4.3.6, setup for a baronial fold.) Turn the valve on for all other applications.

The center valve controls air flow (paper lift) to the feed table paper guides and the nose pipe. (The nose pipe is located in the sheet detector block.)

The right valve controls the vacuum to the vacuum roller. To the right of the valve is the vacuum gauge, which indicates how much vacuum is used to advance sheets into the machine.

NOTE: Excessive vacuum can leave marks on the paper.

4.3 Fold Setup

SIMPLIFIED FOLDING CHART	TYPE OF FOLD	STANDARD PAPER SIZES				
	LETTER	A S	H Y	J X	G M	F L
	Z FF	B S	I Y	K X	P M	C K
	DOUBLE HALF	C J	D Z	– T	R V	N Q
	HALF	REVERSE FIRST FOLD TABLE				
		C	D	L	R	N

4.3.1 Setup For A Letter Fold (8 1/2" x 11" or A4)

Set the feed table as described in Section 4.2.2. Set the sheet detector as described in Section 4.2.1. Set the paper stop on the first/upper fold table to the center of the letter A (G for A4) on the scales. Set the paper stop on the second/lower fold table to the center of the letter S (M for A4) on the scales. Move the paper stops as described in Section 4.2.3. Jog the paper to be processed on an Martin Yale Model 400 or Model 4200 Jogger, or hand-jog.

Remove the first/upper fold table. Turn on the pump motor switch and manually feed one sheet of paper into the folding rollers. Turn off the pump motor switch. Manually feed the sheet through the folding rollers until the sheet edge is in front of the upper and lower accessory shafts. Set the two upper and two lower guide rollers on the accessory shafts so they are equally spaced from the left and right sheet edge. Lock the guide rollers on the flat part of the shafts.

Manually feed the sheet past the guide rollers until the sheet falls onto the conveyor table. Set the stacking wheel assembly so the distance from the edge of the folded sheet to the center of the stacking wheel is about 1". The center of the stacking wheels is the point where the wheels contact the conveyor belt. Reinstall the first/upper fold table.

CAUTION: Complete the operational setup sections before activating the folder.

Turn on the speed control and choose a folding speed setting. Activate the pump motor switch. Fold several sheets and stop the machine. Inspect the folded pieces for fold accuracy and consistency.

NOTE: The letter settings on the fold table scales are approximate only. Fine fold adjustments must be

made with the micro adjustment wheels. This is the same for all fold styles. See Fig. 10

When the feed table paper guides are correctly set and a consistent fold speed is maintained, the folded material will exit the machine consistently. After the necessary corrections are made, complete the folding job.

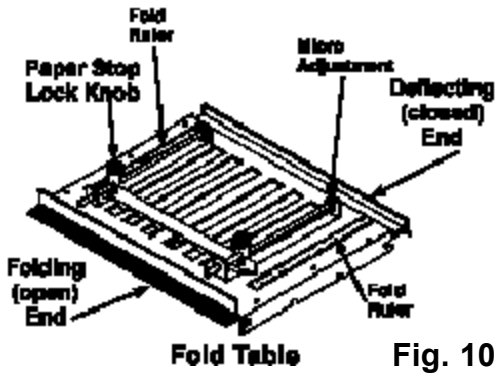


Fig. 10

4.3.2 Setup For A Z Fold (8 1/2" x 11" or A4)

NOTE: The setup for this fold is identical to 4.3.1 except for the positioning of the paper stop on the fold table.
Set the feed table as described in Section 4.2.2. Set the sheet detector as described in Section 4.2.1. Set the paper stop on the first/upper fold table to the center of the letter B (P for A4) on the scales. Set the paper stop on the second/lower fold table to the center of the letter S (M for A4) on the scales. Move the paper stops as described in Section 4.2.3. Jog the paper to be processed on an Martin Yale Model 400 or 4200 Jogger, or hand jog.

4.3.3 Setup For A Double Half Fold (11" x 17" or A3)

NOTE: The setup for this fold is identical to 4.3.1 except for the positioning of the paper stop on the fold table.
Set the feed table as described in Section 4.2.2. Set the sheet detector as described in Section 4.2.1. Set the paper stop on the first/upper fold table to the center of the letter L (N for A3) on the scales. Set the paper stops on the second/lower fold table to the center of the letter T (Q for A3) on the scales. Move the paper stops as described in Section 4.2.3. Jog the paper to be processed on an Martin Yale Model 400 or 4200 Jogger, or hand jog.

4.3.4 Setup For A Half Fold (Single Fold) (8 1/2" x 11" or A4)

If your wish to score, slit, or perforate the half fold, see Section 4.4 for instructions.

Insert the first fold table into position with the folding (open) end toward the fold rollers. The second fold table is placed into position with the deflecting (closed) end toward the fold rollers. Set the paper stop on the first fold table to the setting as shown on the folding chart.

NOTE: Although half folds can be made with either fold table, the first fold table provides better accuracy on regular and lightweight paper stocks. However, to reduce crushed folds and to minimize curl when heavier stock is folded, utilize the second fold table.

For any sheet size not listed on the fold chart, fold the sheet in half by hand. Measure the sheet to the fold. Set the paper stop according to the measurement.

NOTE: The setup for this fold is identical to 4.3.1 except for the positioning of the paper stop on the fold table.
Set up the feed table according to Section 4.2.2. Set the sheet detector as described in Section 4.2.1. Jog the paper to be processed on an Martin Yale Model 400 or Model 4200 Jogger, or hand-jog.

4.3.5 Setup For A French Fold

A french fold requires two steps, or passes, through the machine. During step one, the paper is folded in half and scored. During step two, the sheet is folded in half again at the score mark. Also see Section 4.4.
For step one, set up the machine according to instructions in Section 4.3.4. Set one scoring roller according to the following procedure.

1. Remove the first/upper fold table.
2. To allow easier access to the upper and lower accessory shafts, remove the stacking wheel assembly.
3. Half fold a sheet by hand and mark the sheet at the point of the fold. Place the sheet onto the feed table with the marked edge toward the folding rollers.
4. Loosen the set screws in the scoring roller and backup hub.
5. Turn on the pump motor switch and with the hand wheel, manually feed the sheet through the folder until the marked edge extends to the upper accessory shaft. (Turn off the pump motor switch after the sheet enters the first folding roller.)
6. Align the scoring roller with the mark on the sheet and lock the roller onto the flat part of the shaft.
7. Manually feed the sheet out of the machine.
8. Disengage the lower accessory shaft journal by first rotating the journal counterclockwise. Now pull straight out on the journal. (If the journal is difficult to remove, place the hex key wrench through the hole in the journal and pull out.)
9. Slide the backup hub until the grooved part of the backup hub aligns with the point on the scoring wheel.
10. Engage and lock the lower accessory shaft journal by aligning the shaft and journal, reinserting the journal into the accessory shaft, and rotating clockwise.
11. A slight amount of movement in the backup hub will help ensure adequate scoring without cutting through the paper. Tighten the set screw in the hub onto the flat part of the shaft only to the point where a slight amount of side-to-side movement is apparent in the hub.
12. Reinstall the first fold table and stacking wheel assembly.
13. Fold one sheet according to instructions in Section 4.3.4 and check the score mark locations. Adjust the scoring wheel, if necessary, until the paper is scored in the correct position for refolding.

NOTE: If the paper is cut through during the scoring process, round off the point of the scoring roller with a fine file or emery.

14. Once the scoring mark is in the correct location, run the job through the folder.

For step 2, follow this procedure.

1. Remove the first fold table and the stacking wheel assembly.
2. Disengage the scoring wheel backup hub by rotating the accessory shaft journal counterclockwise and pulling out. Loosen the set screw in the hub and move the hub away from the scoring wheel. Reengage the accessory shaft journal by aligning the shaft and journal, reinserting the journal into the shaft, and rotating clockwise.
3. Set the sheet detector according to instructions in Section 4.2.1 for double thickness (four single sheets).
4. Set the folder up as described in Section 4.3.4.

NOTE: When setting the paper guides, place the folded edge to the left paper guide and the open side to the right paper guide. This step is important because only the right guide air flow can be turned off. This is the same for all fold styles.

5. Measure the sheet from the edge to the center of the score mark and set the appropriate fold table paper stop to the measurement.
6. Turn the air control valve for the right paper guide to the off position.
7. Set the vacuum to maximum and the air flow to minimum.
8. Set the guide rollers on the accessory shafts.
9. Test fold several sheets and check the folds for accuracy. Adjust the paper stop, if necessary, until the paper is folded directly on the score mark.
10. Run the entire folding job through the folder.

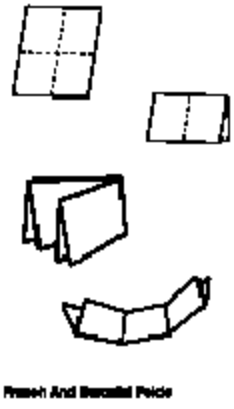


Fig. 11

4.3.6 Setup For A Baronial Fold

A baronial fold requires two steps, or passes, through the machine. During step one, the paper is folded in half and scored in two places. During step two, the half fold is refolded into a letter fold along the two score marks.

For step one, set the machine up as described in Section 4.3.4. Set two scoring wheels according to the following procedure.

1. Remove the first/upper fold table.
2. To allow easier access to the upper and lower accessory shafts, remove the stacking wheel assembly.
3. Half fold a sheet by hand and mark the sheet at the points where it will be refolded into a letter fold. Place the sheet onto the feed table with the marked edge toward the folding rollers.
4. Loosen the set screws in the scoring rollers and backup hubs.
5. Turn on the pump motor switch and with the hand wheel, manually feed the sheet through the folder until the marked edge extends to the upper accessory shaft. (Turn off the pump motor switch after the sheet enters the first folding roller.)
6. Align the scoring rollers with the marks on the sheet and lock each roller onto the flat part of the shaft.
7. Manually feed the sheet out of the machine.
8. Disengage the lower accessory shaft journal by first rotating the journal counterclockwise. Now pull straight out on the journal. (If the journal is difficult to remove, place the hex key wrench through the hole in the journal and pull out.)
9. Slide the backup hub until the grooved part of the backup hub aligns with the point on the scoring wheel. Repeat this procedure for the other scoring wheel.
10. Engage and lock the lower accessory shaft journal by aligning the shaft and journal, reinserting the journal into the accessory shaft and rotating clockwise.
11. A slight amount of movement in the backup hubs will help ensure adequate scoring without cutting through the paper. Tighten the set screw in the hubs onto the flat part of the shaft only to the point where a slight amount of side-to-side movement is apparent in the hubs.
12. Reinstall the first fold table and stacking wheel assembly.
13. Fold one sheet according to instructions in Section 4.3.4 and check the score mark locations. Adjust the scoring marks, if necessary, until the paper is scored in the correct positions for refolding into a letter fold.
14. Once the scoring marks are in the correct locations, run the job through the folder.

For step 2, follow this procedure.

1. Remove the first fold table and the stacking wheel assembly.
2. Disengage the scoring wheel backup hub by rotating the accessory shaft journal counterclockwise and pulling out. Loosen the set screw in the hub and move the hub away from the scoring wheel. Reengage the accessory shaft journal by aligning the shaft and journal, reinserting the journal into the shaft, and rotating clockwise.
3. Set the sheet detector according to instructions in Section 4.2.1 for double thickness (four single sheets).
4. Set the folder up as described in Section 4.3.1.
5. Measure the sheet from the edge to the center of the first fold score mark and set the appropriate fold table paper stop to the measurement. (See Figure 11.) Set the second fold table paper stop to the measured distance to the score mark.
6. Turn the air control valve for the right paper guide to the off position.
7. Set the vacuum to maximum and the air flow to minimum.
8. Set the guide rollers on the accessory shafts.
9. Test fold several sheets and check the folds for accuracy. Adjust the paper stops, if necessary, until the paper is folded directly on the score marks.

NOTE: It may be helpful to set the stacking wheel assembly with the deflector in the down position.

10. Run the entire folding job through the folder.

4.4 Setup For Perforating, Scoring, and Slitting

Fig. 12

The folder can be used to fold and individually or simultaneously slit, perforate, or score paper, depending on job requirements. As seen in Figure 12, there are two scoring rollers, one 7-tooth

per-inch perforating wheel, and two rubber guide rollers on the upper accessory shaft. On the lower shaft are two backup hubs, and two steel guide rollers. An optional slitter, and 3-tooth and 14-tooth perforator are available as options.

The rubber and steel guide rollers control the paper as it exits the folding rollers and help guide the material onto the conveyor table. The rollers should always be positioned with their outer edges approximately 1/4" from the paper margins.

NOTE: Failure to set the guide rollers correctly may cause inaccurate scoring, slitting, or perforating.

It is important to set the backup hubs to the intended scoring, slitting, or perforating operation. The slitting or perforating wheels should be set to the machined (sharpened) side of the hub, opposite from the "V" groove. The high point of the scoring wheel(s) should be aligned in the "V" grooves of the backup hub(s). (See Figure 13.)

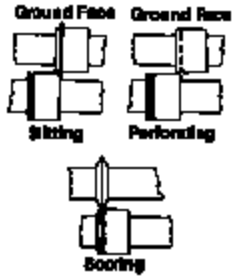


Fig. 13 Enlarged View Of Scoring, Perforating, And Slitting Operation

CAUTION: Failure to correctly set the perforating, scoring, or slitting wheels with the backup hubs may cause permanent damage to the accessories.

To engage the perforating, slitting, or scoring rollers, follow this procedure.

1. Mark a sheet of paper at the point to be perforated, scored, or slit.
2. Set the feed table paper guides so the marked sheet slides freely down between the guides without excessive side play.

NOTE: To ensure consistency when perforating, scoring, or slitting, the feed table paper guides must be set correctly.

3. Remove the first/upper fold table and stacking wheel assembly.
4. Turn on the pump motor switch and with the hand wheel, manually feed the sheet through the folder until the marked edge extends to the upper accessory shaft. (Turn off the pump motor switch after the sheet enters the first folding roller.)
5. Set the perforator or the slitting wheel by loosening the set screw with the provided hex key wrench. Align the perforator or slitter to the mark(s) on the paper and tighten the set screw(s) on the flat part of the shaft. Loosen the set screw in the backup hub(s) on the lower accessory shaft. Slide the machined (sharpened) side of the backup hub(s) against the perforating or slitting blade. Hold the hub(s) against the blades and lock the hubs into position on the flat part of the shaft.

CAUTION: Failure to lock the accessories into position on the flat part of the upper and lower accessory shafts may damage the shafts and prevent free lateral movement of the accessories.

6. Set the scoring roller by loosening the set screw with the provided hex key wrench. Align the scoring roller(s) to the mark(s) on the sheet of paper and lock into position on the flat part of the accessory shaft. Loosen the set screw in the backup hub(s). Disengage the lower accessory shaft journal by rotating the journal a fraction of a turn counterclockwise, and pulling the journal out of the shaft. (If the journal is difficult to remove, place the hex key wrench through the hole in the journal and pull out.) Slide the backup hub(s) until the grooved part of the backup hub(s) aligns with the point on the scoring wheel(s). Engage and lock the lower accessory shaft journal by aligning the shaft and journal, reinserting the journal into the accessory shaft and rotating clockwise.
7. Set the upper and lower paper guide rollers 1/4" from the paper margins.
8. Install the stacking wheel assembly. For sheets up to 12" long, the rollers of the stacking wheel assembly should rest on the conveyor table. For sheets longer than 12", the stacking wheel shaft should be lifted and placed into the stacking shaft hook. The hook is located on the 1/2" tie rod, below the first/upper fold table.
9. Place both the first/upper and second/lower fold tables into position with the closed/deflector end toward the folding rollers. (This allows the paper to travel through the machine without being folded.) As the sheet moves between the upper and lower accessory shafts, the perforating, scoring, or slitting is facilitated. The sheet then exits onto the conveyor table.

Lightweight papers may wrap around the wheel when perforating. On these occasions, simply install the stripper wire around the wheel. The stripper wire (which resembles a large safety pin) is located on the 1/2" tie rod below the first/upper fold table. To install the wire, remove it from the tie rod and place the open end around the left and right side of the perforator. Loosen the two retaining screws and remove the deflector plate from the stacking wheel cross shaft. Retighten the two screws. Place the stacking wheel assembly into the inner hole position in the machine side frames. Close the stripper wire around the shaft. (See Figure 14.)

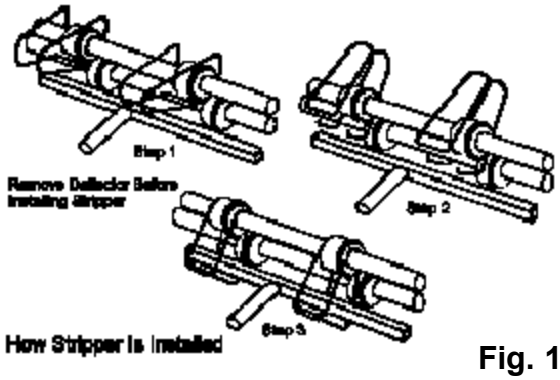


Fig. 14

NOTE: If the paper is cut through during the scoring process, round off the point of the scoring roller with a fine file or emery.

4.5 Start-Up

This procedure assumes the folder is correctly set up for folding, perforating, scoring, or slitting. If not, follow the appropri-

ate instructions in Section 4.2 for the job to be processed.

1. Turn the air and vacuum control valves to the off position. (For refolding, also turn off the right paper guide air flow valve.)
2. Jog a stack of paper on an Martin Yale Model 400 or Model 4200 Jogger, or hand-jog. Jogging fluffs the paper, aligns the edges, and dissipates static electricity.

NOTE: Failure to jog paper may cause feeding, folding, and stacking problems.

3. Place a stack of jogged paper onto the feed table for processing.
4. Turn on the pump motor switch.
5. Slowly turn the air control valve clockwise until the paper stack begins to lift.
6. Turn on the speed control and select a feed speed (usually between 4 & 7 on the scale) by rotating the speed control knob clockwise.
7. Slowly rotate the vacuum valve clockwise until paper sheets begin to advance from the feed table into the folding rollers. Some fine tuning of the air and vacuum control valves may be necessary for optimum feeding. Optimum feed speed for each application will vary with the condition of the machine, operator skill and ability, the job being processed, and the stock being run.
8. Run the entire job through the machine according to instructions.

5.0 Maintenance

WARNING! Maintenance procedures should only be performed by qualified personnel. Disconnect power from the machine before attempting any maintenance procedure. Service, or disassembly of side covers should only be attempted with the power disconnected and locked out.

5.1 Cleaning

5.1.1 General

As often as needed (but at least weekly), vacuum paper dust and other contaminant from the folder. Clean the main body of the machine with a soft, dry cloth.

5.1.2 The Air Roll Rubber Bands

As often as needed, clean the air roll rubber bands with a clean cloth dampened with a mild soap and water solution.

5.1.3 The Folding Rollers

Contaminated folding rollers can cause a variety of problems, including inconsistent folding, wrinkling, jamming, and misfeeding. While the folding rollers of the folder are resistant to chemicals in carbonless paper, toner, ink, and other contaminates will build up on the roller. Clean the folding rollers after every folding job. Regular cleaning will increase roller longevity. Always use Martin Yale Roller Cleaner & Rejuvenator to clean the folding rollers. Use of any other cleaning product may damage the rollers. Rubber Roller Cleaner & Rejuvenator is available from your Martin Yale Dealer, or from Martin Yale.

To clean the folding rollers, follow this procedure.

1. Remove the feed table, folding tables, the stacking wheel assembly, and the top roller cover.
2. Liberally spray Martin Yale Rubber Roller Cleaner onto a clean, dry cloth.
3. Briskly clean the exposed surface of all four folding rollers until no more contaminant appear on the cloth.
4. Turn the hand wheel to expose uncleaned surfaces and continue cleaning until all surfaces are smooth and resilient, not hard or slick.
5. After all roller surfaces are clean, restore power to the machine. Turn on the speed control and run the rollers at medium speed until all roller cleaner residue has evaporated.

WARNING! Make sure all cleaning cloths have been removed from the roller area before starting the machine. Keep hands, fingers, loose clothing and jewelry away from the rollers.

NOTE: Failure to immediately evaporate the roller cleaner residue may cause the rollers to bond together. Bonding may damage the rollers, the drive system, or the feed motor and void the warranty.

6. Inspect the rollers to make sure they are clean, and inspect for damage or wear. Replace, if necessary.

5.1.4 The Pump Filters

As often as needed (but at least monthly), remove the front and rear covers and clean the vacuum and air pump filters.

5.2 Adjustments

5.2.1 The Feed Table Paper Guides.

A number of circumstances may cause the feed table paper guides to become misaligned. To correct the paper guides, follow instructions in Section 5.3.2. To reset the guides when changing paper sizes, follow instructions in Section 4.2.2.

5.2.2 Guide Finger Adjustment.

Correct setting of the guide fingers is necessary for efficient feeding. The guide fingers prevent the paper from lifting too high off the feed table. Incorrect setting of the guide fingers may cause streaking, smudge marks, and paper infeed problems. Follow instructions in Section 3.10 to correctly set the guides.

5.2.3 Air Block Spring Adjustment.

The air block must remained sealed against the air feed roll to ensure consistent feeding. The air block spring is located on the feed roll shaft at the left side of the air block. The spring applies pressure to the block to ensure the seal against the vacuum roller and is held in place by a set collar. Too much pressure may also cause feeding problems.

To correctly set the spring tension, loosen the screw in the set collar. Pull the collar away from the spring until there is no pressure on the block. Push the collar and spring against the air block and continue to push until the spring is compressed 3/4". Lock the screw in the set collar.

5.2.4 Paper Guide Rollers.

The paper guide rollers are located two each on the upper and lower accessory shafts. The upper rollers are rubber-covered steel while the lower rollers are steel. Each roller has a set screw and should be locked into position on the flat part of the shaft.

The guide rollers function to control the last two to three inches of the sheet as it exits the folding rollers, especially during slitting, scoring, and perforating. Set and align the guide rollers to approximately 1/4" from the paper margins to prevent skewing. (See Figure 12 page 9)

5.2.5 Angular Control Adjustment.

Paper skewing to the right or left on the feed table (after entering the first folding roller) can be corrected by increasing or decreasing the spring tension (changing the angle) on the second folding roller. The adjustment screw can be accessed through the hole in the right side cover. (See Section 5.3.8.)

NOTE: This adjustment is factory set and should only require readjustment if the roller spring is worn or a gap exists between the first and second folding rollers, or it becomes impossible to score, slit, or perforate parallel to stock edges. Do not make this adjustment until you are sure the paper guides are parallel with each other, and that they are perpendicular to the folding rollers. You must also be sure the paper is cut squarely. A crooked fold can be compensated for by utilizing the fold table micrometer wheels. (See Fig. 10 page 8)

To make the adjustment, insert the supplied hex key wrench into the adjusting screw inside the right side cover. Clockwise rotation will result in paper pulling more to the right. Counterclockwise rotation will result in paper pulling more to the left.

CAUTION: Excessive counterclockwise adjustment may result in the screw leaving its station and falling into the inside cover.

5.2.6 Timing Belt Adjustment

The timing belt may stretch as a normal process of operation and the tension must be reset, or the tension must be set correctly when installing a new belt. If the belt is set too loosely, it may fall off. It it is set too tightly, it may stress the motor shaft. Have a qualified service person check the line amperage. The amperage should not exceed 3.2 Amps. To access the motor and timing belt, qualified personnel should follow this procedure.

1. Disconnect power to the machine.
2. Remove the speed control, pump motor switch, hand wheel, the circuit breaker, and the six right side cover mounting screws. Remove the cover.
3. The fold motor is located on the inside of the right main frame with the motor shaft extending through the frame. The motor is held in place by four screws that extend through the frame. The timing belt connects the motor pulley with the 60T timing pulley located on the main drive roller. Loosen the four motor mounting screws. Set the belt tension with a belt tension gauge. If a gauge is unavailable, set the tension so the belt deflects about 1/4". Reinstall the cover and components in reverse order.

5.3 Machine Alignment

CAUTION: This procedure, sometimes referred to as field alignment, should be performed only by qualified service personnel.

A number of reasons may cause misalignment, including tampering, machine relocation, or excessive wear. Correct alignment is essential for successful operation of the folder. See Section 2.0 to orient yourself to the areas referred to in this procedure.

CAUTION: The paper used for this alignment is important. 20# or 24# bond is ideal. The paper should be straight and parallel on the long edges, and perpendicular to the sides. Use of paper that has not been cut accurately may result in misalignment. Sheets used during this alignment should not be reversed or turned over. Always use the same edge of the sheet as the lead edge. Failure to follow this procedure may invalidate the alignment process.

5.3.1 Neutral Position

To begin the alignment procedure, first set the machine to a neutral position according to the following procedure.

1. Place the folder on a flat, level work surface or stand. Check the base plate to make sure all four pads are in place.
2. Thoroughly clean all four folding rollers according to instructions in Section 5.1.3.
3. Install both fold tables with the closed/deflector end toward the folding rollers.
4. Lift the sheet detector to its top position and lock into place.
5. Loosen the left and right locking nuts on the turnbuckle assembly.
6. Install the feed table but do not connect the air hoses.
7. Set the paper guides to maximum paper width.
8. Connect the turnbuckle assembly to the feed table.
9. Adjust the turnbuckle so the top front of the air block contacts the bottom of the feed table.
10. Set the paper guide cross shaft on the feed table to the center of the 5/8" slot and lock into position.
11. Insert the provided hex key wrench through the hole in the right side cover and into the alignment adjusting screw. Turn the adjusting screw until there is no pressure on the spring adjustment. (The spring exerts pressure on the second folding roller.) Turn the set screw 3 1/2 turns clockwise.

5.3.2 Paper Guide Alignment

The folder is now in a neutral position and ready to be adjusted so sheets of paper enter correctly into the folding rollers. To align the paper guides, follow this procedure.

1. Open the feed table paper guides to their maximum open position.
2. Place an 11" x 17" (or A3) sheet onto the feed table and slide the sheet down until the leading edge is between the first and second folding rollers.
3. Carefully set the paper guides until they are within 1/16" from the long side of the sheet.

CAUTION: At no time touch or otherwise move the sheet out of position. Doing so may compromise the alignment. If you suspect the sheet has moved, repeat steps 1 through 3.

4. Observe the long axis of the guides and the sheet edge. If they appear to be parallel, no adjustments are required.
5. If the guides are not parallel to the sheet edges, adjust one guide at a time until they are by first loosening the hex socket cap screw on the paper guide block. Move the guide until it is parallel with the sheet edge. Do not move the sheet out of position! Lock the guide into position by retightening the cap screw.
6. Repeat this procedure for the other paper guide.
7. Remove the sheet from the feed table.
8. Connect the left and right paper guide air hoses.

5.3.3 The Sheet Detector Block

The next step in the alignment procedure is to align the sheet detector block. Do so by following this procedure.

1. Loosen the hex socket set screw located on top of the sheet detector block.
2. Place a sheet of 11" x 17" (or A3) paper onto the feed table and set the paper guides so the sheet slides freely between the guides without excessive side play.
3. Slide the sheet down so the front of the sheet aligns with the target marks on the feed table. The target marks are to the left and right of the vacuum roller.
4. Lower the sheet detector.
5. Look straight down on the target marks and move the detector block so the front of the sheet detector contacts the sheet edge and aligns with the target marks. Also make sure the sheet detector tips are aligned laterally with the left and right holes in the vacuum roller. Retighten the set screw in the sheet detector block.

5.3.4 Timing Block

Correct setting of the timing block (located on the left side of the vacuum roller) is necessary for correct feeding. The block is set via the turnbuckle assembly. One end of the turnbuckle assembly is attached to the timing block and the other end is attached to the feed table. Set the timing block according to this procedure.

1. Make sure the front end of the timing block is in contact with the feed table as indicated in Section 5.3.1.
2. Shorten the turnbuckle assembly by making 4 1/2 turns with the buckle and bring the locking nuts in contact with the buckle. Do not lock the nuts in position at this time.
3. Either by turning the vacuum roller forward by hand, or by using the hand wheel to manually forward the machine, align the edges of the countersunk holes in the vacuum roller with the front of the sheet detector.
4. Place a sheet of paper over the holes in the vacuum roller. Plug in the machine. Turn on the pump motor switch and adjust the vacuum control knob to maximum. The sheet should be pulled down into the vacuum roller and the vacuum gauge should read 20 or higher. If the gauge does not read 20 or higher, readjust the turnbuckle in 1/4 to 1/2 turn increments until the gauge reads 20 or higher.
5. Turn the pump motor switch off.

5.3.5 Nose Pipe

The nose pipe in the sheet detector block serves to inject air into the leading edge of the paper stack to facilitate smooth feeding. Check the setting of the nose pipe by following this procedure.

1. Place a 1/8" to 1/4" stack of 11" x 17" (or A3) paper onto the feed table. Disconnect the air lines from the paper guides and turn on the pump motor switch. Adjust the air and vacuum knobs to maximum. With your thumbs, block off the paper guide air hoses. Observe the rear of the paper stack. If the nose pipe is correctly adjusted, the bottom 3 to 6 sheets should flutter.
2. If the sheets are not fluttering, loosen the set screw (in the sheet detector block) that locks the nose pipe in position. Rotate the nose pipe until the sheets flutter. Before retightening the set screw, make sure the nose pipe air holes align with the rubber bands on the air feed roll. Reconnect the air lines to the paper guides.

5.3.6 Feed System Test

Set the sheet detector according to instructions in Section 4.2.1. Start the folder according to instructions in Section 4.5. When correctly adjusted, you will hear a distinctive “swooshing” sound as paper is feeding into the folder. (You can hear this sound on the enclosed video presentation.) If you do not hear the sound, adjust the turnbuckle in 1/4 to 1/2 turn increments until the sound is produced. Turn off the machine.

5.3.7 The Feed Table Cross Shaft

The next step in machine alignment is to check positioning of the stacking wheel cross shaft. Do so by following this procedure.

1. Place the stacking wheel shaft into the stacking wheel hook.
2. Place a full stack of paper onto the feed table.
3. Turn on the speed control and set to minimum speed.
4. Turn on the pump motor switch.
5. Run two or three sheets through the machine and turn off the speed control and pump motor switch when the trailing end (3" to 5") of the fourth sheet is still between the paper guides.
6. Pull back the stack of paper on the feed table and observe the tail end of the sheet. If the sheet lays flat on the feed

table, no cross shaft adjustment is necessary. If the paper does not lay flat on the feed table (climbs up the right or left paper guide), adjust the feed table cross shaft.

7. Loosen the cross shaft hex head set screw on the side of the feed table. If the sheet is climbing the right paper guide, observe the gap between the left paper guide and the sheet. Place a prying tool (bar, wrench, or screwdriver) between the shaft and table. Move the shaft away from the folding rollers a distance equal to 1/2 of the gap between the left paper guide and the sheet. If the sheet is climbing the left paper guide, observe the gap between the right paper guide and the sheet. Place a prying tool (bar, wrench, or screwdriver) between the shaft and table. Move the shaft toward the folding rollers a distance equal to 1/2 of the gap between the right paper guide and the sheet.
8. Manually feed the sheet through the machine. If it exits the machine wrinkled, discard the sheet. Otherwise place it back on the feed table and repeat steps one through seven until the sheet lays flat between the paper guides.

CAUTION: Sheets used during this alignment should not be reversed or turned over. Always use the same edge of the sheet as the lead edge. Failure to follow this procedure may invalidate the alignment process.

5.3.8 The Angular Control Adjustment

The next step in the alignment process is to fine tune the alignment via the angular control adjustment. (See Section 5.2.5.) To do so, follow this procedure.

1. Place a stack of paper onto the feed table, turn the speed control on low, and turn on the pump motor switch.
2. Observe the sheets as they move into the folding rollers. If there is a narrow gap between the sheet edge and either paper guide, use the angular adjustment screw to correct the gap. (Turn the screw only in 1/4 to 1/2 turn increments and no more than 1 1/2 complete turns. If the sheet is moving to the left after entering the folding rollers, turn the screw clockwise while the machine is running. If the sheet is moving to the right, turn the screw counterclockwise while the machine is running. Making the appropriate adjustment while the machine is running will allow you to watch the results of the adjustment.
3. Adjusting the screw while the machine is running will virtually always render the best results. If, for some reason, the sheets do not enter the folding rollers in a straight manner, repeat instructions in Section 5.3.1, Section 5.3.7.
4. As a final check, set up the machine to perforate an 11" x 17" sheet in the center according to instructions in Section 4.4. Fold the sheet along the perforation and check to make sure the (long) sheet edges are parallel. Minute adjustments can be made with the adjustment screw in 1/8 to 1/4 turn increments.

Your folder is now correctly aligned.

5.4 Clearing A Jam

When the folder is set up correctly, jams are unlikely to occur because of a machine malfunction. However other factors (humidity levels, paper quality, operator error, etc.) may cause the machine to jam. If a jam should occur, follow this procedure.

1. Turn off the speed control and pump motor immediately.
2. Unplug the machine.
3. Remove the fold tables (if necessary).
4. Remove the stacking wheel assembly.
5. Remove the jammed paper using manual rotation of the hand wheel (if necessary).

CAUTION: The jam must be cleared from the machine before restarting. If the jam was severe enough to stall the motor, the circuit breaker may have activated (tripped). Allow several minutes for the motor and breaker to cool. Push the reset button on the circuit breaker.

6. Determine the cause of the jam and remedy the problem. See Section 6.6 for possible causes of jams.
7. Install the fold tables and the stacking wheel assembly. Plug the machine in and resume operation.

5.5 Circuit Breaker Activation

Make sure the folder is plugged into a dedicated line. If the folder circuit breaker activates (trips) continuously, have a qualified service technician check the following.

1. The line amperage to the DC folding motor. The reading should not exceed 3.2 amps. If the reading is more than 3.2 amps, the technician should check all gears and bearings for adequate lubrication. Make sure the machine is resting on a flat, level surface, and that all four pads are in place on the bottom of the machine. Check the timing belt tension.
2. The circuit breaker, speed control, and fold motor. Replace, as needed.
3. The electrical line for fluctuations.

5.6 Lubrication

5.6.1 The Folding Roller Bearings

The folder should be lubricated every eight hours of machine operation according to the following procedure.

1. Turn off the machine and disconnect and lock out power.
2. Clean the folding rollers according to instructions in Section 5.1.3.
3. Remove any accumulated lint or dust from the ends of the folding roller shafts and the shaft bearings with a brush or a clean, dry cloth.
4. Lubricate the bearings at the ends of the folding roller shafts with one drop of light machine oil in each bearing.

CAUTION: Do not drop oil onto the rubber portion of the folding rollers. If oil is spilled on the rollers, remove it immediately with Martin Yale Rubber Roller Cleaner & Rejuvenator.

5.6.2 The Vacuum And Air System

The pump motor, vacuum, and compressor pumps do not require lubrication.

6.0 Troubleshooting

The following guide will help you identify the causes and provide solutions for the most common operational problems of the folder.

6.1 The Motors Will Not Start

There may be no power flowing to the machine. Make sure the machine is connected to an active AC outlet of the appropriate voltage and amperage. The folder requires a dedicated 115 volt, 15 amp, or 220 volt 10 amp line.

The folder circuit breaker may have activated (tripped). Turn off the speed control. Let the circuit breaker cool down then push the reset button.

CAUTION: If the circuit breaker trips again immediately, a more serious problem may be indicated. Notify a qualified service technician.

One or more electrical components may be faulty. Have a qualified technician check the electrical components. Also have the technician check all wiring connections. The bearings may need lubrication. Lubricated according to instructions in Section 5.6. The folding motor belt may be loose or may not be adjusted correctly. (See Section 5.2.6.)

6.2 Paper Will Not Feed

There may be a paper infeed problem. The sheet detector may be set incorrectly, or may be worn. The sheet detector block may be set incorrectly. See Sections 3.9 and 4.2.1. The timing block spring may not be set correctly. See Section 5.2.3. The bearing in the vacuum roller may be worn. The vacuum roller should turn freely toward the folding rollers, but not backward. Replace the bearing. The paper guides may be set incorrectly. See Section 4.2.2. The air and vacuum settings may be incorrect. See Sections 4.1, 4.2.8, and 4.5. The guide fingers may be set incorrectly. See Sections 3.10 and 5.2.2. The feed table backstop is not set correctly, or is not in use. See Section 4.2.4. The vacuum and air pump filters may be clogged. See Section 5.1.4. The paper may be excessively curled. Turn the paper over on the feed table and check the setting of the guide fingers according to instructions in Sections 3.10 and 5.2.2.

6.3 The Length Of Fold Varies

The feed speed during operation may not be the same speed at which the machine was set up. See Sections 4.1, 4.2.3, and 4.2.7. Line voltage fluctuations may be occurring. See Section 5.5. The paper stop retaining screws on the bottom of the fold tables may have come loose. Tighten both screws on the bottom of the fold tables. The folding rollers may be contaminated. See Section 5.1.3. The fold table strips may be binding. Check each set of strips to make sure the sheet has clearance between the strips and a smooth track to the paper stop.

6.4 The Paper Wrinkles

The vacuum may be set too high. Check the settings according to instructions in Sections 4.1, 4.2.8, and 4.5. The guide fingers may be set incorrectly. See Sections 3.10 and 5.2.2. The folding rollers may be dirty or excessively worn. Clean according to instructions in Section 5.1.3. After cleaning, rotate the hand wheel slowly and observe the area between the folding rollers. A gap between the first and second rollers on the right side may indicate a need for angular control adjustment. See Sections 5.2.5 and 5.3.8. Gaps in any other location may indicate a need to replace the folding rollers, the folding roller springs, or the folding roller bearings.

6.5 Flecking

Flecking appears on the leading edge of the sheet as one or two nicks in the paper. Flecking is caused by incorrect setting of the sheet detector. Set the sheet detector according to instructions in Sections 3.5, 3.9, and 4.2.1.

6.6 The Paper Jams Or Tears

See Section 5.4

Paper jams or tears may be caused by double sheeting. Double sheeting may be caused by paper that is not correctly jogged, ink that is not dry, incorrect setting of the sheet detector, or incorrect setting of the speed, vacuum, or air. Jog the paper, allow adequate drying time for inks. See Sections 3.5, 3.9, 4.1, 4.2.7, 4.2.8, 4.5. The folding rollers may be contaminated. Clean the rollers according to instructions in Section 5.1.3. The folding speed may be too high for the paper stock being folded. Adjust the feed speed according to instructions in Section 4.2.7. The stacking wheel assembly may be misadjusted. Adjust the stacking wheel assembly according to instructions in Section 4.2.5. Paper may have wrapped around the perforating wheel. Install the stripper wire as instructed in Section 4.4. The conveyor belts may not be turning. Check the belt shaft, the tension springs, and the conveyor drive belt. Replace parts as needed. The stacking wheel assembly may not be set properly. Set the stacking wheel according to instructions is Section 4.2.5. The paper guide rollers may not be set properly. Set the rollers according to instructions in Section 5.2.4. The stacking wheels may have seized. Check the stacking wheels and repair or replace as needed.

6.7 Crooked Paper Folds

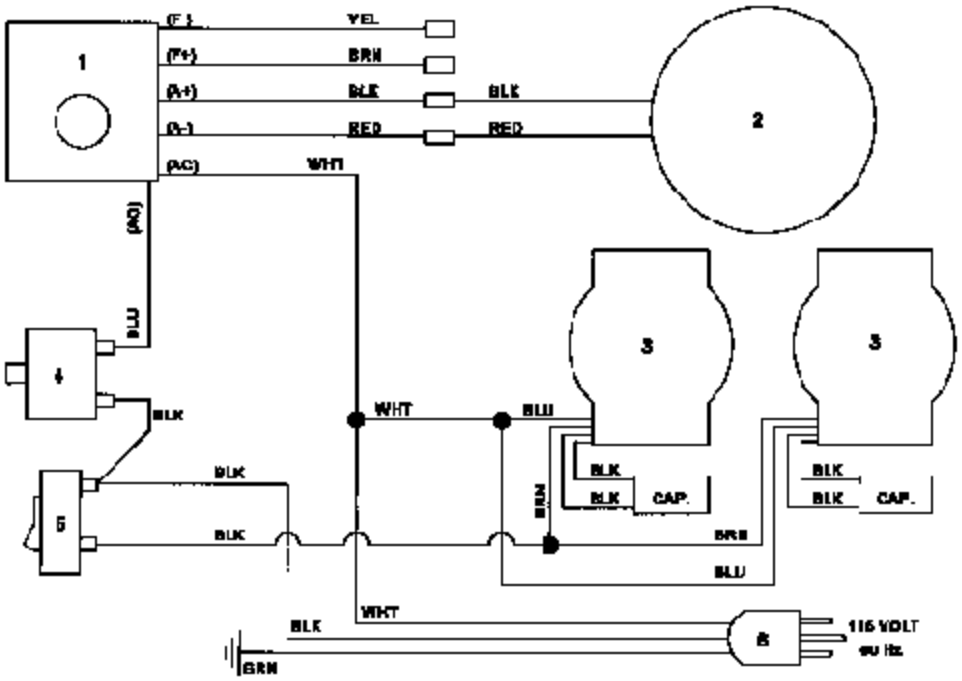
The paper may not be folding squarely. Adjust the fold table paper stops according to instructions in Sections 4.2.3. Also see Section 4.2.8. The folding rollers may be contaminated. Clean the folding rollers according to instructions in Section 5.1.3. Flecking may be occurring. Set the sheet detector according to instructions in Sections 3.5, 3.9, and 4.2.1. The paper may not be cut squarely/parallel. Recut the paper.

6.8 Marks On The Paper

The sheet detector may be set too low causing flecking. Reset the sheet detector according to instructions in Sections 3.5, 3.9, 4.21. The folding rollers may be contaminated. Clean the rollers according to instructions in Section 5.1.3. The guide fingers may need to be readjusted. Adjust the fingers according to

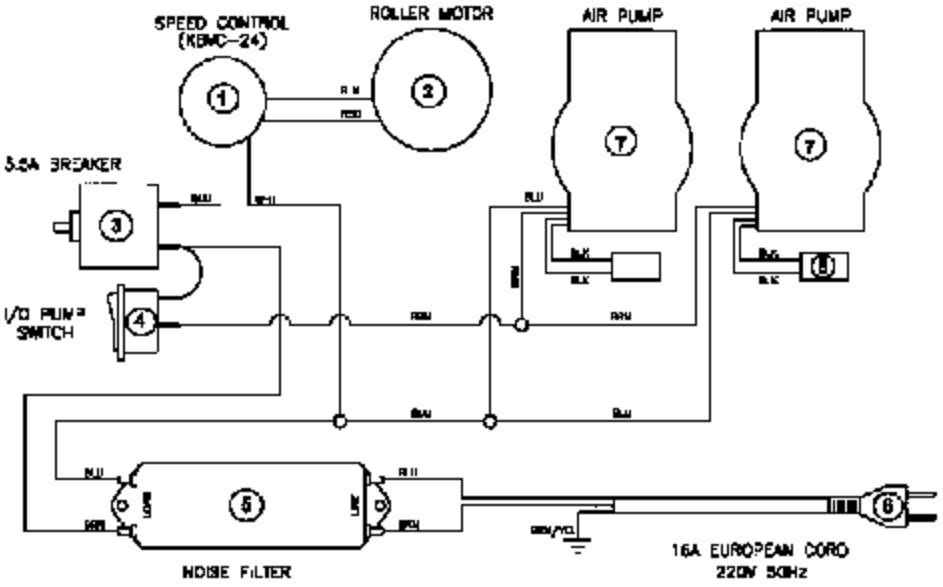
instructions in Sections 3.10 and 5.2.2. The air and vacuum settings may be set incorrectly. Check the settings according to instructions in Sections 4.1, 4.2.8, and 4.5. The ink on the folded sheet may not be dry. Allow adequate drying time before attempting to fold. Remember - humidity will govern the length of drying time.

Wiring Diagrams



Parts List (110 volt)

1.	Speed Control	M-S045100
2.	Roller Motor	M-S021048
3.	Air Pump	M-S037219
4.	Circuit Breaker	M-S045002
5.	I/O Switch	M-S033015
6.	Power Cord	M-S037212



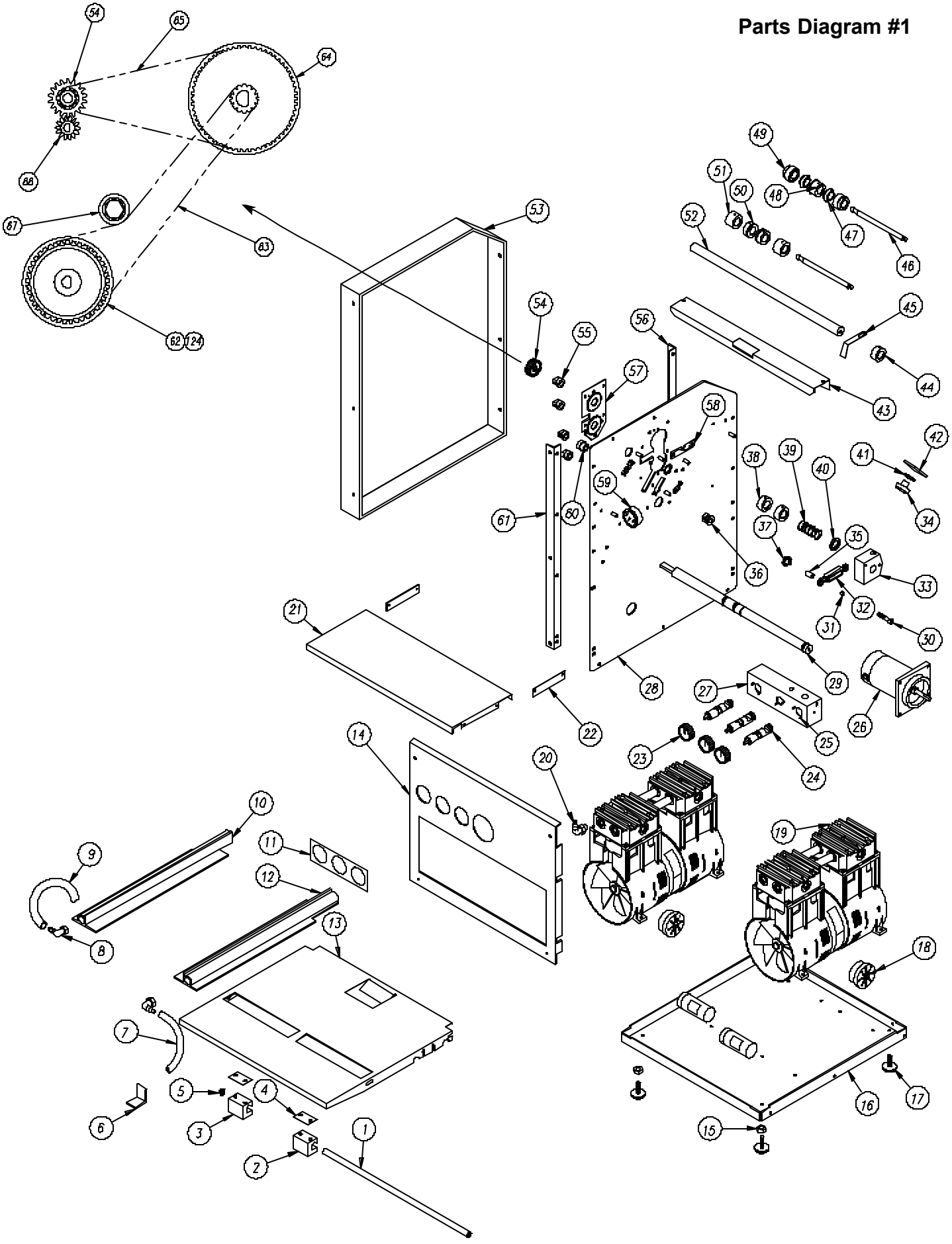
Parts List (220 volt ONLY)

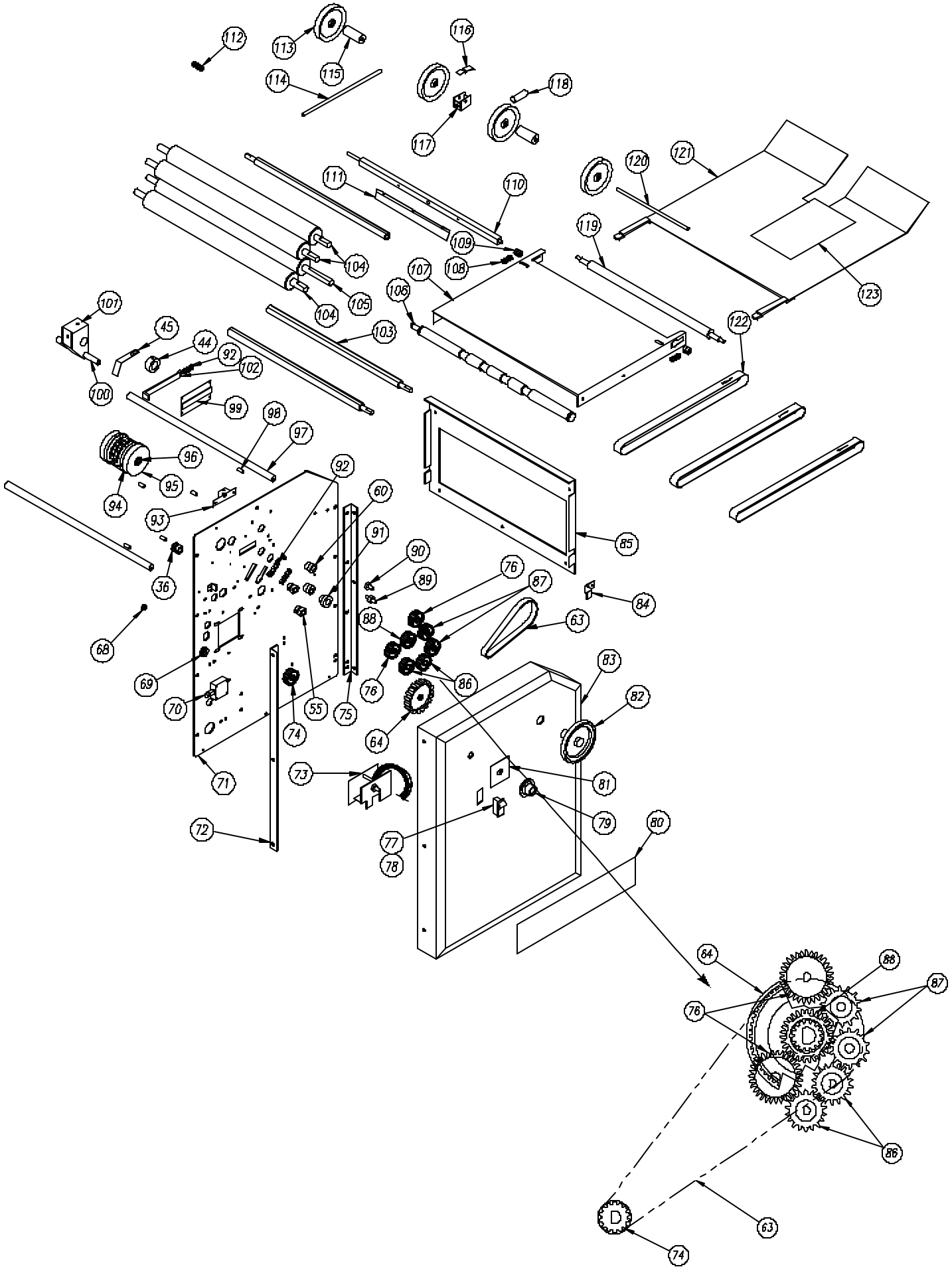
1.	Speed Control	M-O095207
2.	Roller Mtr-180VDC	M-S021050
3.	3.5 Amp. Breaker	M-S045194
4.	I/O Pump Switch	M-S033053
5.	Noise Filter	M-S045193
6.	16/3 220V Pwr Crd	M-S037222
7.	220V Thomas Pump	M-O095324
8.	12.5mf 370V Capacitor	MRS037161

PARTS LIST

Item #	Part No.	Qty.	Description
1	M-O095015	1	Paper Guide Shaft
2	W-O095238	1	R.H. Rod Clamp
3	W-O095214	1	L.H. Rod Clamp
4	W-O095215	2	Grip Plate
5	M-S014016	1	4L1-FF Nyliner
6	W-A095232	1	Back Stop
7	M-S043036	5.59’	1/2 ID Vinyl Hose (RH Paper Guide)
8	M-S043031	2	3/8 x 1/2 x 90 Hose Fitting
9	M-S043036	3.17’	1/2 ID Vinyl Hose (LH Paper Guide)
10	W-O095213	1	L.H. Paper Guide
11	M-S015281	1	Air/Vacuum Control Label
12	W-O095212	1	R.H. Paper Guide
13	W-O095307	1	Feed Table
14	W-O095288	1	Front Panel
15	M-S63251449	4	1/4 X 20 Keps Nut
16	W-O095305	1	Base
17	M-S63751408	4	Glide (Foot)
18	M-S037219	2	Filter Element
19	M-O095219	2	Air/Vacuum Pump, 110V
20	M-S043051	2	3/8 NPT x 5/8 Hose Fitting
21	W-O095298	1	Pump Vent Guard
22	W-O095299	2	Pump Guard Bracket
23	M-S63751547	3	Control Knob
24	W-O095309	3	Control Valve
25	M-S018002	3	1/8 x 3/4 Roll Pin
26	M-S021048	1	100VDC Roller Drive Motor
27	W-O095310	1	Air Vacuum Manifold
28	W-O095304	1	L.H. Main Frame
29	W-O095255	1	Feed Shaft
30	M-S003048	1	10-32 x 1 1/2 SHC Screw
31	M-O000160	1	Spacer
32	M-S037304	1	Turnbuckle #8-32
33	M-O095220	1	Air Timing Block
34	W-O032036	1	1/4 - 20 x 5/8 Thumb Knob
35	M-S013044	1	1/4 X 7/6 X 1 Bushing
36	W-S013008	2	Machined Bushing
37	M-S007018	1	1/4-20 DC Thumb Nut
38	M-O095038	2	Shaft Collar
39	M-S031073	1	Compression Spring
40	M-S013045	2	.628 x 1 x 1/8 Bushing
41	M-S008008	1	1/4 I.D x 1/2 O.D. Flat Washer
42	W-A095224	1	Sheet Detector Assembly
43	W-O095279	1	Roller Guard
44	M-O095221	2	Guide Finger Collar
45	W-O095233	2	Guide Finger
46	W-O003019	2	Accessory Journal
47	M-O003083	2	Scoring Roller
48	W-A03085B	1	7 Tooth Perforator
49	M-O003080	2	Rubber Guide Roller
50	M-O003082	2	Lower Back Up Hub
51	M-O003076	2	Guide Roller Back Up Hub
52	M-O003066	1	Tie Rod
53	M-O095905	1	Left Cover
54	W-O095136	1	Dual Gear
55	M-S013009	1	3/8 ID Bushing w/Flats
56	W-O095295	1	Rear Cover Mount Bracket (LH)
57	W-O095275	1	Bearing Plate
58	W-O095265	1	Roller Guard Bracket (RH)
59	M-S037347	1	Vacuum Gauge, 1/8 NPT
60	M-S013010	3	3/8 ID Flanged Bushing
61	W-O095294	1	Side Cover Mount Bracket (LH)
62	W-S022019	1	44T Timing Pulley w/Flange
63	M-S025010	2	210 XL037 Timing Belt
64	M-S022021	2	60/15T Timing Pulley
65	M-S025008	1	144 XL037 Timing Belt
66	M-O095903	1	14T, 3/8” ID Nylon Gear
67	M-S013053	1	1/2 X 5/8 X 1 Bushing
68	M-O095242	1	Tapered Index Pin
69	M-S035007	1	3/8 ID Rubber Grommet
70	M-S045194	1	Circuit Breaker
71	W-A095300	1	R.H. Side Frame
72	W-O095303	1	Side Cover Mount Bracket (RH)
73	WRA420028	1	4200 Speed Control Assy
74	M-S022017	1	12T Motor Pulley
75	W-O095302	1	Rear Cover Mount Bracket (RH)
76	M-O003033	2	24T x 3/8ID Nylon Gear
77	M-S033015	1	110VAC Rocker Switch, 1HP
78	M-S033053	1	220VAC Rocker Switch
79	M-S032057	1	Speed Control Knob
80	M-S015024	1	Speed Control Plate
81	M-S015267	2	Side Cover Label
82	M-S032047	1	Hand Wheel
83	M-O095904	1	Right Cover
84	W-O001560	1	Belt Guard
85	W-O095289	1	Rear Panel
86	M-O003035	2	18T x 3/8ID Nylon Gear
87	M-O003036	2	18T x 1/4ID Nylon Gear
88	M-O03034A	1	24T x 1/2ID Nylon Gear
89	M-O003074	1	Idler Gear Stud
90	M-O095320	1	Idler Stud, 959
91	M-S013013	1	Thick Flanged Bushing
92	M-S031059	4	Folding Roller Spring
93	W-O095280	1	Roller Guard Bracket (LH)
94	M-O095230	2	Rubber Ring, Vacuum Roller
95	M-O095216	1	Vacuum Roller
96	M-S020009	2	Clutch Bearing
97	W-O095276	2	Tie Rod
98	M-O003104	11	Feed Table Pins
99	W-O095014	1	Roller Adjust Channel
100	M-O095222	1	Nose Pipe
101	W-A095223	1	Retarder Block Assembly
102	W-O095027	1	Adjustable Spring Stop
103	M-A003018	2	Accessory Shaft
104	WRA003015	3	Folding Roller
105	WRA095034	1	Main Drive Roller
106	W-O095135	1	Conveyor Drive Shaft
107	W-O095035	1	Exit Table
108	M-S031034	4	Compression Spring
109	W-S014005	2	Nylon Bearing
110	W-O008017	1	Square Shaft
111	W-O008012	1	Paper Deflector
112	M-S031050	1	Compression Spring
113	M-S034001	4	Stacking Wheel
114	W-O003093	1	Stacking Wheel Shaft
115	W-O095268	2	Stacking Wheel Weight
116	W-O008013	1	Stacking Finger Spring
117	W-O003090	1	Axle Housing
118	M-S043046	1	Vinyl Tip

Parts Diagram #1

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PARTS LIST CONT.

Item #	Part No.	Qty.	Description
119	W-O003064	1	Conveyor Idler Shaft
120	M-O008011	1	Stacking Wheel Axle
121	W-A095064	1	Stacking Tray
122	M-S024002	4	Conveyor Belt
123	M-S015282	1	Folding Chart
124	M-S022022	1	Pulley Flange
125	M-S003004	4	1/4-20 x 1/2 Hex Hd. Bolt
126	M-S030015	14	Paper Stop Rubber Bumpers
127	M-O095037	4	Nylon Spacer
128	W-O095032	2	Paper Stop Tie Bar
129	M-S007054	12	6-32 Keps Nut
130	M-O095321	4	Paper Stop Clamp
131	W-O095124	2	Paper Deflector
132	M-S007086	4	3/8 - 24 Locking Nut /Set Screw
133	M-S015283	4	Fold Table Ruler
134	M-O095131	4	Adjusting Thumb Knob
135	M-S008014	4	3/8 x 5/8 x .01 Spring
136	M-S001092	12	6-32 x 3/8 Phil. Screw
137	M-S032036	4	Paper Stop Lock Knob
138	M-O095260	4	Adjustment Screw
139	W-O095126	2	Upper Fold Plate
140	W-O095012	2	Paper Stop
141	W-A095125	2	Lower Fold Plate

Assemblies Available

W-A095255	1	Vacuum Roller Assembly
W-A095307	1	Feed Table Assembly
W-A095233	2	Guide Finger Assembly
W-A095310	1	Air Vacuum Manifold Assembly
WRA095103	1	Stacking Wheel Assembly
WRA095101	2	Fold Table Assembly

Optional

WRA03085C	1	3 Tooth Perforator
WRA03085D	1	14 Tooth Perforator
WRA03085A	1	Slitter

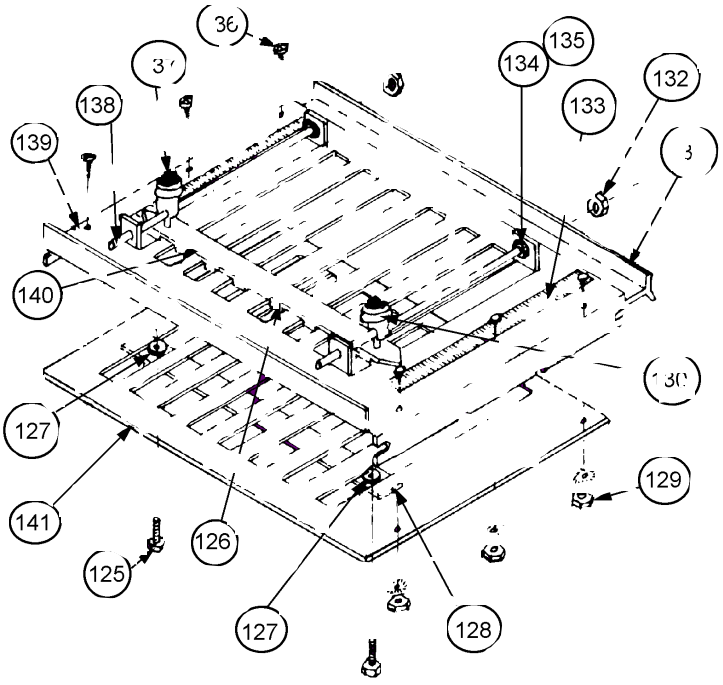
Not Illustrated

M-S043058	1	1/4 NPT x 1/4 Pl. Pipe Ftg-Str.
M-S043057	2.25’	1/4 ID x 3/8 OD Auto Vac Hose
M-S043059	1	3/8 NPT x 1/4 Pl. Pipe Ftg-90° Elb.
M-O095036	4	Clamp Spring
M-O095322	4	Paper Stop Clamp Stud
M-S043037	2.67’	Clear Vinyl Hose, Nose Pipe
M-S043037	2.10’	Clear Vinyl Hose, Exhaust
M-O003132	1	Stripper Springs
M-S037052	2	3/8 x 90 Street Elbow

Not Illustrated (cont.)

M-S031060	1	Stack Wheel Support Spring
M-S010010	2	5100-62 Ext Retaining Ring
M-S013050	2	5/8 X 3/4 X 3/16 Bushing
M-S002015	1	1/4-20 X 1/4 Set Screw
M-S002055	2	10-32X3/16 Brass Tip Set Scr.
M-S003082	2	10-32 x 3/16 SHC Screw
M-S037352	1	1/8 x 2 NPT Nipple
M-S037353	1	1/8 NPT x 90 Elbow
M-S043050	1	1/4 NPT x 1/2 x 90° Fitting
M-S043034	2	3/8 x 90 Hose Fitting
M-S043049	2	3/8 NPT x 1/2 Straight Fitting
M-S043032	1	1/4 Straight Hose Fitting
M-S010010	6	5100-62 Ext. Retaining Ring
M-S023011	6	O-Ring, .093 X .437 ID
M-S043035	.34’	5/8” ID Air Pump Hose
M-S043035	.59’	5/8” ID Vacuum Pump Hose
M-O095204	1	Bushing Retainer
M-S014021	2	Nyliner Bushing
M-O003079	2	Guide Roller Arbor
M-S037212	1	1613 SO Cord 8 Ft. Lg

Parts Diagram #2



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